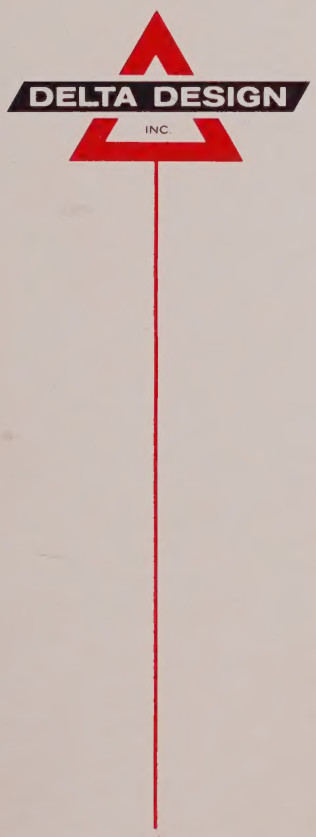
OPERATING AND MAINTENANCE MANUAL

OF

MECHANIZED AMBIENT HANDLER ASSEMBLY

INCLUDING MINI-LOOP AND CART

MODEL 8824



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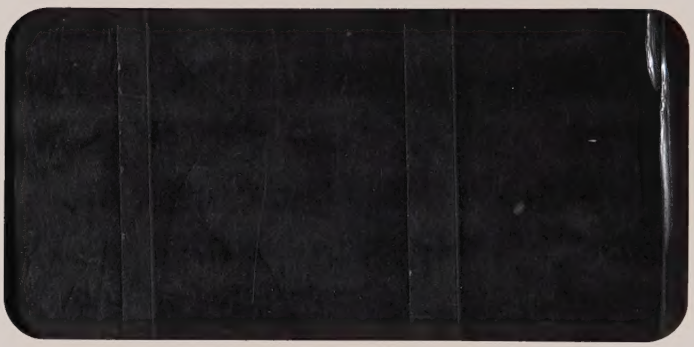

ENVIRONMENTAL CONTROL EQUIPMENT FOR RESEARCH AND INDUSTRY

OPERATING AND MAINTENANCE MANUAL

OF

MECHANIZED AMBIENT HANDLER ASSEMBLY

INCLUDING MINI-LOOP AND CART

MODEL 8824

DELTA DESIGN INC

8000 FLETCHER PARKWAY, LA MESA, CALIF. - TEL (714) 465-4141 - TWX: (910) 322-1343 - CABLE: DELTA

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1.0 INTRODUCTION

The Delta Design Inc., Mechanized Ambient Handler Assembly Model 8824 is a high rate production precision mechanical assembly to be used by the semiconductor industry to test TO-5's, Dual Inline Packs, and Flat Packs. Principally the semi-conductors are installed into plastic carriers as a means of conveying the devices for proper registration to the test contactor assembly.

With zero test time the Model 8824 is capable of handling devices at the rate of 5000 units per hour. The mechanized ambient handler assembly interfaces with all Delta Design test contactor assemblies which are used on the "Charger" environmental handler. For proper selection of test contactor assembly to mate with device being tested, suggest confer with Delta sales representative.

1.1 Loading

Loading devices for testing in the Model 8824 mechanized ambient handler assembly can be

accomplished in the following methods:

(A) Hand Load

(B) Magazine load (Delta Assembly P/N B2630660)

(C) Bowl Feed

2.0 INSTALLATION

2.1 Test Contactor Assembly

Installation of any of the Delta test contactor assemblies to the Model 8824 mechanized ambient handler assembly is accomplished by simply swinging aside the two cam assemblies at the front of the equipment and inserting the contactor assembly into the opening. While it is not mandatory it will be easier to insert the contactor assembly, if the transfer block is shifted to the aft portion. When positioned finally the four studs will protrude through the four holes in the contactor assembly plate. Swinging the cam assemblies inward and dialing the two cam wings will securely attach the test contactor

assembly to the equipment. Reverse the above procedure to remove the contactor assembly.

2.2 Pneumatic Air Cylinder to Air Supply

The Model 8824 mechanized ambient handler assembly is complete with a high pressure air supply hose however, the fitting has not been included because of variations in plumbing systems in user's facilities. Delta Design recommends a quick disconnect type fitting for this application.

3.0 MAINTENANCE

3.1 General

Exploded view type drawings and assembly drawings are included with this manual for ease of part identification should the Model 8824 mechanized ambient handler assembly require replacement parts. Parts that should be inspected during routine preventative maintenance include all moving parts such as air cylinders and cam followers.

3.2 Pneumatic Air Cylinder Assembly

The air pressure gage of the Model 8824 mechanized ambient handler assembly is located for easy visibility on the left side of the equipment. Delta recommends the regulator be set to read 40 lbs., of air pressure by adjustment of the screw coming out of the top of the air cylinder cover. The two glass filters also are visible from the outside and should be observed daily to see that no water is present and that oil is present in the proper glass.

NOTE

See enclosed "Installation and Service instructions" for proper preparation and care of MINI-LINE filter, regulator, and lubricator.

3.3 Transfer Mechanism Assembly, Finger Adjustment

Reference is made to drawing 2630436 enclosed for adjusting the fingers. To gain access to fingers remove four (4) screws holding the adapter chute bridge (P/N 1630445) to the side plates.

Use a gage block set at 1.005 inch for proper spacing between the top of fingers and bottom of input chute assembly. It will be necessary to loosen then tighten four (4) screws which hold fingers in place while gage block is in place.

3.4 Cleaning

Any commercial solvent or detergent may be used. Freon-TF is recommended. Remove dust particles with low velocity compressed air.

3.5 Lubrication

Except for air cylinder lubrication described in paragraph 3.2 no lubrication is necessary on the Model 8824 mechanized ambient handler assembly since all bearings are self lubricated.

3.6 Dis-Assembly

Reference is made to the enclosed exploded view drawing 2630684 which shows a breakdown of all parts comprising the Model 8824 mechanized ambient handler assembly. Dis-assembly is

explainable by removal of fasteners as shown in the exploded view illustration. Retaining pins will require a drift pin to remove and replace or preferably placed on an arbor press and pressed in or out.

3.7 Repair and Replacement

Dis-assemble, clean, and inspect the mechanized ambient handler parts as previously described. Replace all excessively worn parts and re-assemble as shown in drawing 2630684, 2630436, or 2630446 which are enclosed in this manual.

3.8 Re-Assembly

The re-assembly of the Model 8824 mechanized ambient handler assembly is accomplished in the reverse order of the dis-assembly procedure identified in 3.6.

3.9 Testing

Testing the Model 8824 mechanized ambient handler assembly will best be accomplished by processing semi-conductor devices through the

equipment with the proper test contactor assembly in place. Verification of contact continuity and proper processing with no "hangup" of devices in carriers indicates the equipment is ready for production.

4.0 ELECTRONIC CIRCUITS

The electronic circuits of the Ambient Handler consist basically of the "Mini-Loop", which operates the transfer actuator.

4.1 Customers Connections

(Refer to Drawing D1605654). Unplug power cord and remove four corner screws from the bottom of the electronic package and expose the mini-loop printed circuit board assembly.

4.2 End of Test

A normally closed contact which the customer must connect between common (terminal #9, 10, or 11) and terminal #1 will actuate the transfer, when it is opened. If the customers equipment can not furnish a contact closure,

he may use a built-in buffer amplifier and reed relay circuit (terminals 6, 7, and 8). The correct reed relay must be selected and plugged into pin sockets on the P.C. board provided for this purpose. Refer to D2604849 o or D2604832 for further details. The customer must provide B (+) to terminal 7, B (-) to terminal 8, and the signal to terminal 6. The relay may be plugged-in in one of two ways. Depending upon the sense of the signal, the relay must be plugged in so that it opens (de-energizes) when the transfer is supposed to operate.

4.3 Re-Probe

A device may test bad because of poor contact between device leads and contactor. The Mini-Loop may be programmed to briefly withdraw the device from the contactor a short distance and then re-insert the same device for a second try. After one re-probe cycle

this function will not repeat, instead, the transfer will go in all the way to pick up a new device. To initiate a re-probe cycle, (preset into its memory Q4A) momentarily ground terminal 13, (no connection on terminal 12) before applying the end of test signal. The re-probe circuit may also be preset by un-grounding terminal 12, with terminal 13 permanently grounded. This re-probe function is not available on Mini-Loop P.C. board number D2604832 and assembly D2605653.

4.4 Inhibits

The Mini-Loop may receive an "end of test" signal yet may be inhibited from actuating the transfer by grounding terminal 5, or by un-grounding terminal 4, or both. To operate normally, terminal 4 must be grounded, and terminal 5 must be open. The transfer will operate the instant that the inhibit is removed.

4.5 Description of Circuits

The electronic circuitry of the Mechanized Ambient Handler consists of the following basic components:

1. A "ready to test" microswitch.
2. A "half'in" microswitch (needed for re-probe function only).
3. A "full-in" microswitch.
4. An electrical solenoid air valve.
5. An electronic package containing the "Mini-Loop", Circuit Assembly, Power Line Filters, Fuse, Power Switch, and Pilot Light.

5.0 FUNCTIONS OF BASIC COMPONENTS:

5.1 The "ready to test" microswitch operates when a device is in the test contactor (full out). The customer may connect this switch to his equipment to initiate the test cycle. A small delay may have to be provided because this switch trips before the transfer has come to a full stop at the test contactor.

5.2 The "half-in" microswitch is connected to the

Mini-Loop to initiate return of the transfer in midstroke for re-probing the same device a second time. This is an optional feature which gives a device, which may have failed the first test due to poor contact, a second chance.

5.3 The "full-in" microswitch signals the Mini-Loop, that the transfer is near the device pickup and drop position (full in).

5.4 The "Mini-Loop" electronics package consists basically of a printed circuit board assembly, which provides the following functions:

A. It receives and stores an "end-of-test" signal from the customers equipment, actuating the transfer, unless inhibited.

B. It monitors inhibiting signals, which may inhibit the transfer.

C. When actuated, it holds the transfer at the full-in position for a fixed amount of time, to allow parts to leave and enter the transfer block.

D. It applies power to the solenoid valve through a low RFI triac.

E. It re-probes a device one time, if it receives a re-probe signal while the transfer is at the test head. This is an optional function, which is not provided on all Mini-Loops. P.C. board assembly D2604849 includes the re-probe circuit whereas D2604832 does not. This is recognized by the missing components (empty holes) in the P.C. board.

6.0 DESCRIPTION OF THE MINI-LOOP CIRCUIT

Refer to Schematic D2604849, 120 volt AC power is applied to the air solenoid valve through triac Q9 by its associated gate relay K1. The 12 volt DC power supply consists of transformer T1, diodes D1 and D2, and capacitor C1.

An insolating end of test signal buffer amplifier consists of emitter follower transistors Q6 and Q8, and relay K2. Use of this buffer circuit is optional.

The customer must supply power and signal to this circuit, and he must select the proper relay as explained on D2604849. The remainder of the circuit is designed around Amelco 300 series high noise immunity micrologic. One-shot multi-vibrator Q1A triggers when terminal 6 and terminal 7 are un-grounded. (This is the start of the Mini-Loop operating cycle). Discrete components around Q1A consist of switch bounce suppressor R7, R8, and C11, timing capacitor C8, and noise suppressor C3. When triggered, terminal 5 of Q1A goes low, setting type D flip flop Q2A. Terminal 3 of Q2A goes high, allowing terminal 5 of invertor Q2B to go high, unless strip terminal 5 is grounded, or strip terminal 4 is un-grounded, causing inverter Q2D to have a low output at terminal 15, which holds terminal 5 of Q2B low. If terminal 5 of Q2B is allowed to go high, terminal 7 of Q2B goes low, setting type D flip flop Q2C. Its terminal 11 will go high, energizing reed relay K1 through diode D3 and emitter following transistor Q5. This will turn on triac Q9 and

energize the air valve, making the transfer go "in". When the transfer is almost full in, a microswitch connected to strip terminal 3 opens, triggering one-shot multi-vibrator Q1B. Discrete components around Q1B consist of switch bounce suppressor R9 and C12, timing capacitor C2, timing resistor R4, and noise suppressor C4. When Q1B is triggered, output terminal 11 will go low, resetting flip flops Q2A and Q2C. This removes base current from Q5. However, base current to Q5 is now supplied by terminal 14 of Q1B, which is high while Q1B is timing out (approximately 150 milli-seconds.) This holds the transfer in long enough to allow parts to be picked up and dropped. When Q1B has timed out, base drive is removed from Q5, and the transfer will return to the contactor ("full-out" position) with a new device.

6.1 Re-Probe Circuit

One shot multi-vibrator Q3A may be triggered by un-grounding strip terminal 12 (with 13 grounded) or grounding strip terminal 13 (with 12 un-grounded). Discrete components

around Q3A consist of switch bounce suppressor R11, R10, and C13, inverter Q7, timing capacitor C9, and noise suppressor C5.

Triggering Q3A makes its terminal 2 go high momentarily. This presets the master Q4A of master-slave flip-flop Q4A and Q4B. When the transfer is on the in-stroke, strip terminal 14 becomes grounded. This sets slave flip flop Q4B, making its terminal 13 go high. This triggers one shot Q3B, making its terminal 11 go low momentarily, which re-sets transfer flip-flops Q2A and Q2C. This causes the transfer to return in mid-stroke immediately. A second re-probe cycle is not possible, because flip flop Q4B has to be re-set to trigger one-shot Q3B again. Therefore, at the next "end-of-test" signal, the transfer will go in all the way, triggering one-shot Q1B, which then re-sets reprobe flip flops Q4A and Q4B. This re-probe circuit is not supplied on all Mini-Loops as mentioned previously.

7.0 TROUBLE SHOOTING

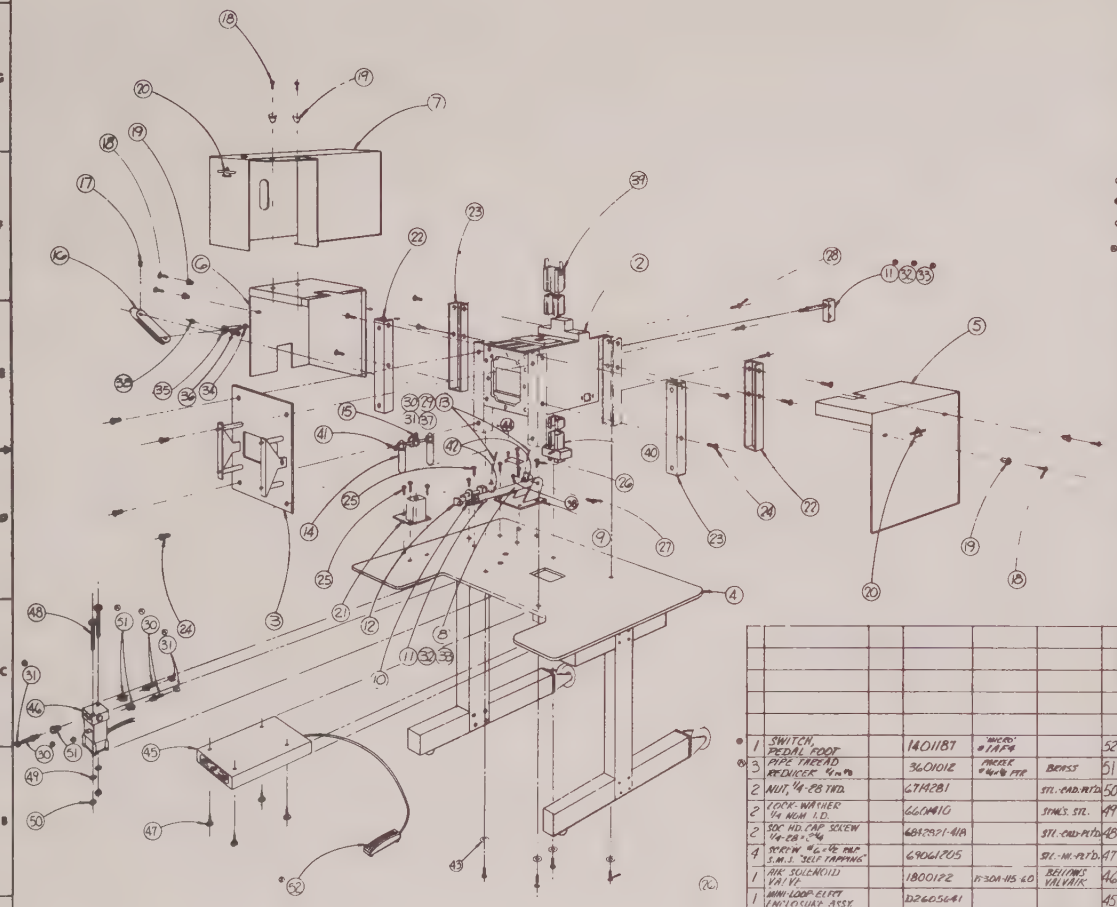
1. Actuator does not operate: Check:
   Air pressure, electrical power, pilot light, fuse, terminal 1 must be momentarily ungrounded, no connection to terminal 1 if input buffer circuit (terminals 6, 7, 8,) is used, terminal 4 must always be grounded, terminal 5 must always be ungrounded check presence of +12 volt DC at terminal 2 relative to ground.

2. Transfer goes in but does not return:
   Check adjustment of "full-in" microswitch. Switch should trip when transfer is within .025" to .050" of full-in position.

3. Mini-Loop operates with input to terminal 1, but not with buffer circuit:
   Check for correct relay selection and positioning, proper signal and supply voltage, proper polarity of supply voltage. Improper polarity may cause damage.

8.0 WARRANTY

All parts and performance of the Model 8824 Mechanized Ambient Handler assembly are warranted for a period of 90 days. Where components are warranted by the manufacturer (other than Delta Design Inc.,) such warranty is transferred to the customer.



1	CLIP, HOSE		A1630631			
4	WASHER #10 FLAT		6610000			
2	COUPLING SHORT		3600037	11999		
1	STREET ELBOW 90° 1/8 TOYE		3600086	1/8 CD		
1	OUTPUT CHUTE ASSY		D2630524			
1	INPUT CHUTE ASSY		D2630525			
2	NUT-WEIGHT THIN 10-24 NC-3		G710240	79-TM-04		
2	VALVE-FLOW		1800100	MFC-2		
1	BOLT: SHOULDER 10-11 3/8 x 1/4		1700112			
1	ROD ENDS		4100151	TRA-4PN		
1	LOCK-NUT 1/4-28		G714240			
2	COVER MICROSWITCH		1800790	5PAB		
2	ACTUATOR MICROSWITCH		1400232	MC7711		
13	CLAMP-HOSE		3600032	PAN5000-2		
7	FITTING-HOSE		3600081	PAN1924		
6	FITTING-HOSE		3600030	PAN1752-1		
3	SCREW SOCKET HD CAP 1/4-20 x 1 1/4 LG		6814205-408			
1	SHOULDER BOLT 10-24 x 1 1/8 x 1/4		1700135			
8	SCREW SOCKET HD #10-32 x 1 LG		6810320-108			
5	SCREW SOCKET HD #10-32 x 3/4 LG		6810313-408			
12	SCREW SOCKET HD #10-32 x 1/2 LG		6810321-208			
2	LEG ASSY-RIGHT FRONT-LEFT REAR		C2630507			
2	LEG ASSY-LEFT FRONT-RIGHT REAR		C2630508			
1	BRACKET REGULATOR		C1630500			
2	DELTA DECAL		A6005021			
6	NYLATCH GROMMET		1500816	N559-3-4		
6	NYLATCH STUD		1500817	N329-3-1-1		
1	PIN (SPIROL)		1500825	PA1156 1000DP		
1	CRANK ARM		B6305113			
1	NUT-5/16-18 THD		G734161			
1	REGULATOR ASSY		3600034			
2	HOSE PNEUMATIC		3600033			
1	ACTUATOR TAB		A6304199			
2	MICROSWITCH MICROSWITCH ASSY		1400149	BZ-2R-A2		
1	BRACKET MICROSWITCH		B6304198			
1	AIR CYLINDER BRACKET		C2630495			
1	AIR CYLINDER		3600037			
1	CYLINDER COVER		D6305119			
1	COVER - LEFT SIDE		D6305118			
1	COVER-RIGHT SIDE		D6305117			
1	CART ASSY		E2630480			
1	CONTACTOR INTERFACE ASSY HANDLER		C2630522			
1	MECHANISM ASSY		E2630436			

1	SWITCH, PEDAL FOOT		1401187	"MICRO" #1AP4		52
3	PIPE THREAD REDUCER 1/4 x 1/8		3601012	FACTOR #1/4-18 PTF	BRASS	51
2	NUT, 1/4-28 THD.		G714281		STL.-CAD.PLTD	50
2	LOCK-WASHER 1/4 NOM. I.D.		6610416		STAINS. STL.	49
2	SOC HD. CAP SCREW 1/4-28 x 3/4		6813921-412		STL.-COLD-PLTD	48
4	SCREW #6-32 PAN S.M.S. "SELF TAPPING"		6906205		STL.-NI-PLTD.	47
1	AIR SOLENOID VALVE		1800122	11-30A-115-60	BELLOWS VALVAIR	46
1	MINI-LOOP ELEFX (MICROWAVE ASSY.		D2605641			45

NOTES

MECHANIZED AMBIENT HANDLER ASSEMBLY WITH MINI-LOOP & CHRT

8824

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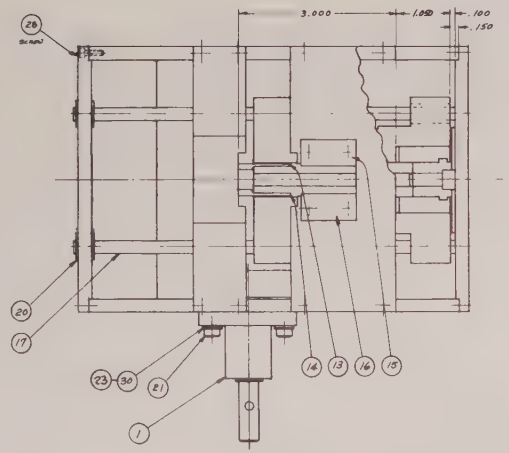
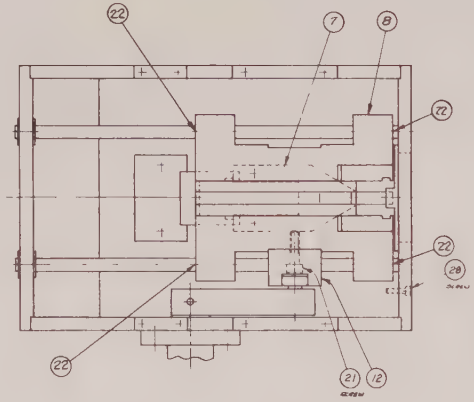
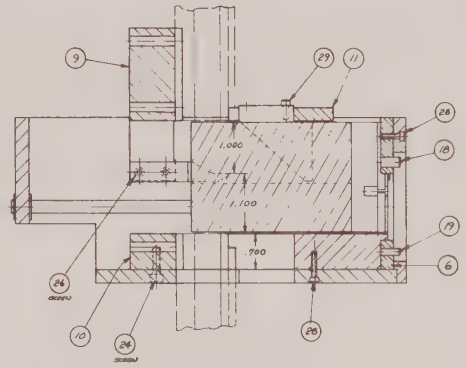
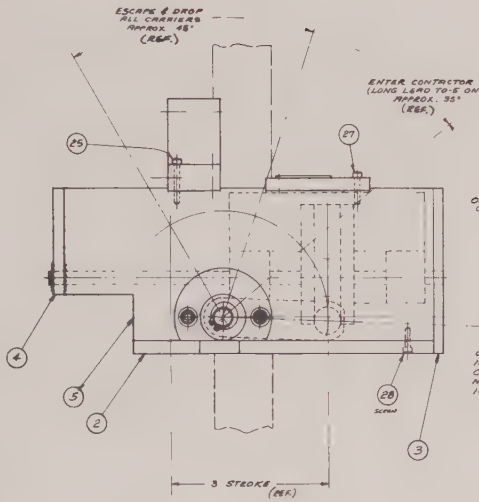
2630684

SHEET 1 OF 1









OVER TRAVEL FOR LOCK-UP IN TEST POSITION, APPROX. 2°. CONTACTOR OPERATES APPROX. .001 NOT REQUIRED WHEN HANDLER IS POWER OPERATED. (REF.)

NOTES:

ITEM NO.	QTY. REQ'D	NOMENCLATURE OR DESCRIPTION	CODE IDENT	IDENTIFYING NUMBER	SPECIFICATION	MATERIAL OR NOTE
34						
33						
32						
31						
30	2	WASHER #10 - FLAT		6610000		7.S.T.
29	4	SOC HD CAP SCR #4 40 x 1/4		6804401-408		"
28	22	" " " #4 40 x 1/8		6804403-808		"
27	4	" " " #4 40 x 1/2		6804401-208		"
26	4	" " " #4 40 x 5/8		6804405-808		"
25	4	" " " #4-40 x 1/4		6804403-408		"
24	2	" " " #8-32 x 1/2		6808321-208		"
23	2	WASHER #10-LOCK		6601010		"
22	4	BEARING		4100025		"
21	4	SOC. HD. CAP SCR. #10-32 x 1/8		6810321-208		"
20	4	TRIARC RETAINING RING 1/8		1500608		"
19	1	CONTACTOR PIN, BOTTOM		A 1630454		
18	1	CONTACTOR PIN, TOP		A 1630461		
17	2	TRANSFER BLOCK SHAFT		A 1630453		
16	1	DROP CAM, L.H.		A 1630455		
15	1	DROP CAM, R.H.		A 1630460		
14	1	STOP FINGER, L.H.		A 1630458		
13	1	STOP FINGER, R.H.		A 1630459		
12	1	CRANK TRACK		B 1630456		
11	1	DROP CAM BRIDGE		B 1630457		
10	1	ADAPTER CHUTE BLOCK		B 1630445		
9	1	ADAPTER CHUTE BRIDGE		C 1630444		
8	1	TRANSFER BLOCK		C 1630443		
7	1	SUPPORT RAMP		C 1630442		
6	1	STOP PLATE		C 1630441		
5	2	SIDE PLATE		C 1630440		
4	1	BACK PLATE		C 1630439		
3	1	FRONT PLATE		C 1630438		
2	1	BASE PLATE		C 1630437		
1	1	CRANK ASSEMBLY		B 2630446		

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

NEXT ASSY.	USED ON	SERIAL NOS.	DATE EFF.	DWG. REV. LTR.
E2630576	8024	11-10-15 ON	3 24 69	
APPLICATION		EFFECTIVITY		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS .XX ± .010 .XXX ± .005 ANGLES ± 1/2°

MATERIAL

FINISH

	BY	DATE
DESIGN	[illegible]	1/13/69
DRAFTED	[illegible]	1/24/69
CHECKED		
APPROV	[illegible]	3/6/69

MODEL NO.

PART NO. 2630436

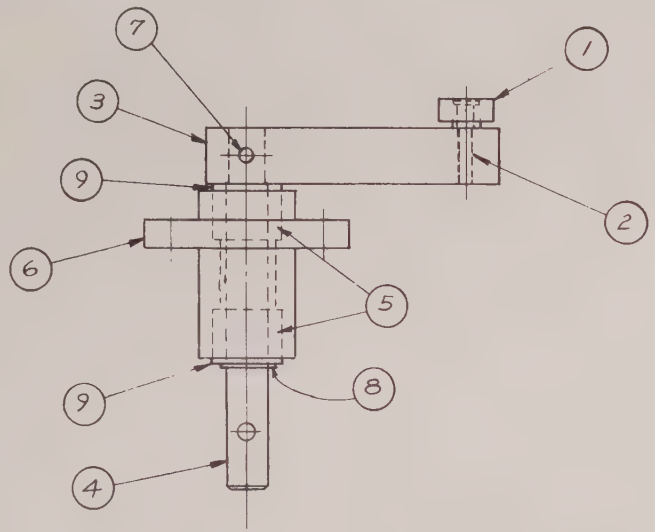
DELTA DESIGN INC.
8000 FLETCHER PKWY
LA MESA, CALIF. 92041
TEL. A/C (714) 465 4141

TITLE: HANDLER MECHANISM ASSY.

SIZE D | CODE IDENT. NO. | DRAWING NO. 2630436 | REV LTR

SCALE 1/1 | SHEET 1 OF 1

2630436



REVISIONS				
ZONE	LTR.	DESCRIPTION	DATE	APPROVED

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2	WASHER		A1630514			9
1	RETAINING RING		1500607	TRUARC P/N 5100-37	S. ST.	8
1	"SPIROL" PIN		1500824	SPIROL NDP P/N 156-0750	S. ST.	7
1	CRANK BRG. BLOCK		B1630447			6
2	SHAFT BRG.					5
1	CRANK SHAFT		A1630449			4
1	CRANK		B1630450			3
1	CRANK ROLL PIN		A1630451			2
1	CRANK ROLL		A1630452			1

NOTES:

NEXT ASSY.	USED ON	SERIAL NOS.	DATE EFF.	DWG REV. LTR.
E2630516	B024	24-20-1¢ON	3-24-69	

APPLICATION | EFFECTIVITY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS DECIMALS ANGLES
± 1/64 .XX ±.010 ± ½
.XXX ±.005

MATERIAL:

FINISH:

	BY	DATE
DESIGN		
DRAFTED	GR	1/14/69
CHECKED		
APPROV.		

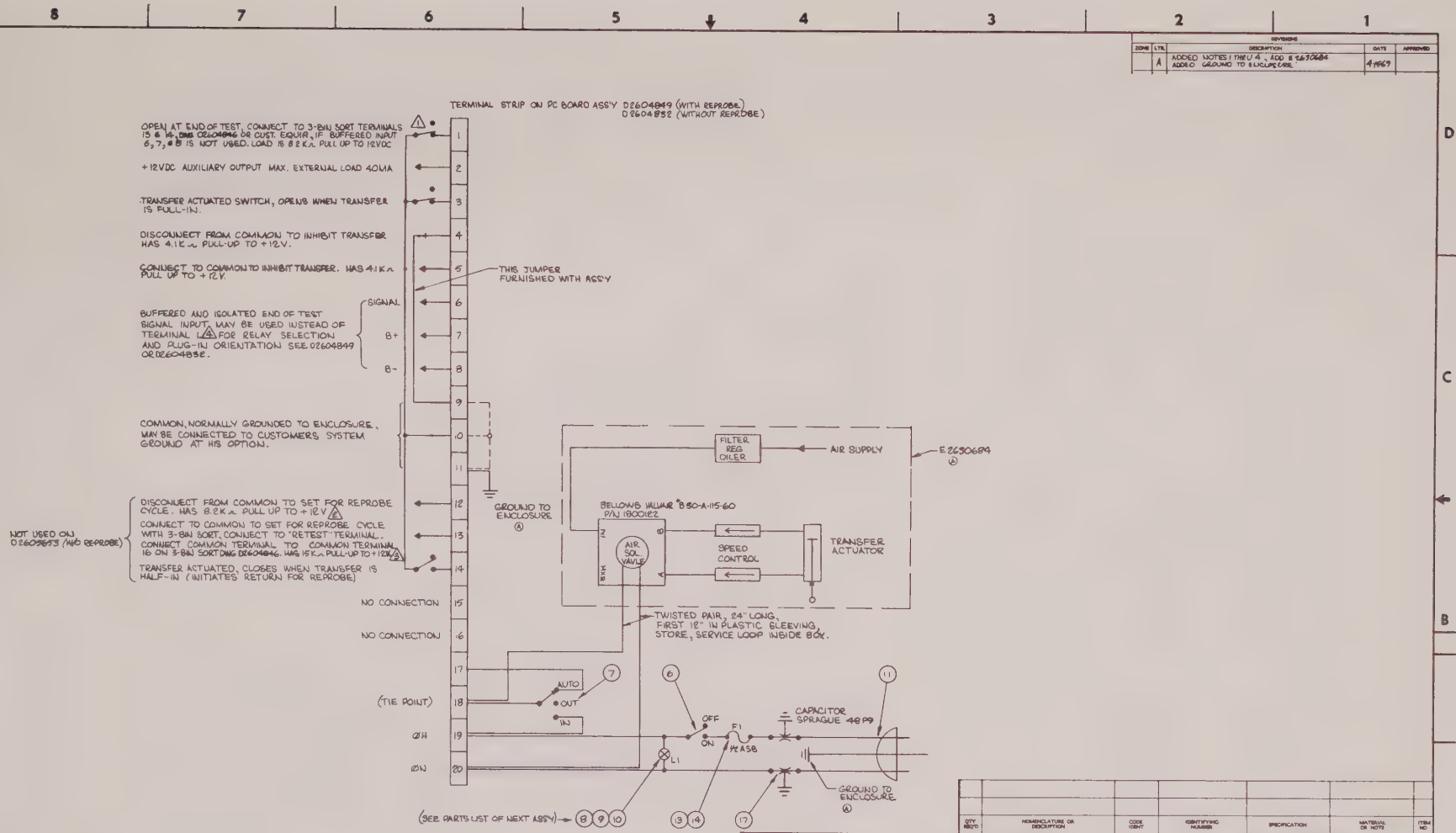
PART NO. 2630446

DELTA DESIGN INC.
8000 FLETCHER PKWY.
LA MESA, CALIF. 92041
TEL: A/C (714) 465-4141

TITLE: CRANK ASSEMBLY

SIZE	CODE IDENT. NO.	DRAWING NO.	REV. LTR
B		2630446	

SCALE 1/1 SHEET 1 OF 1


TERMINAL STRIP ON PC BOARD ASS'Y D2604849 (WITH REPROBE)
D2604852 (WITHOUT REPROBE)
OPEN AT END OF TEST, CONNECT TO 3-BIN SORT TERMINALS 15 & 16, (D2604846 OR CUST. EQUIV.) IF BUFFERED INPUT 6,7,&8 IS NOT USED. LOAD IS 82K Ω PULL UP TO 12VDC
+12VDC AUXILIARY OUTPUT MAX. EXTERNAL LOAD 40MA
TRANSFER ACTUATED SWITCH, OPENS WHEN TRANSFER IS FULL-IN.
DISCONNECT FROM COMMON TO INHIBIT TRANSFER HAS 4.1K Ω PULL-UP TO +12V.
CONNECT TO COMMON TO INHIBIT TRANSFER. HAS 4.1K Ω PULL UP TO +12V.
THIS JUMPER FURNISHED WITH ASS'Y
BUFFERED AND ISOLATED END OF TEST SIGNAL INPUT MAY BE USED INSTEAD OF TERMINAL 1 (A) FOR RELAY SELECTION AND PLUG-IN ORIENTATION SEE 02604849 OR D2604852.
SIGNAL
B+
B-
COMMON, NORMALLY GROUNDED TO ENCLOSURE, MAY BE CONNECTED TO CUSTOMERS SYSTEM GROUND AT HIS OPTION.
GROUND TO ENCLOSURE (A)
NOT USED ON 02605653 (W/O REPROBE)
DISCONNECT FROM COMMON TO SET FOR REPROBE CYCLE. HAS 82K Ω PULL UP TO +12V (E)
CONNECT TO COMMON TO SET FOR REPROBE CYCLE WITH 3-BIN SORT, CONNECT TO "RETEST" TERMINAL. CONNECT COMMON TERMINAL TO COMMON TERMINAL 16 ON 3-BIN SORT DWG D2604846. HAS 15K Ω PULL-UP TO +12V (2)
TRANSFER ACTUATED, CLOSES WHEN TRANSFER IS HALF-IN ("INITIATES" RETURN FOR REPROBE)
NO CONNECTION
NO CONNECTION
(TIE POINT)
ØH
ØN
FILTER REG OILER
AIR SUPPLY
E2630684 (A)
BELLOWS VALVAIR B50-A-115-60 P/N 1800122
AIR SOL. VALVE
SPEED CONTROL
TRANSFER ACTUATOR
TWISTED PAIR, 24" LONG, FIRST 12" IN PLASTIC SLEEVING, STORE, SERVICE LOOP INSIDE BOX.
AUTO
OUT
INJ
OFF
ON
F1 1/4 ASB
L1
CAPACITOR SPRAGUE 48P9
GROUND TO ENCLOSURE (A)
(SEE PARTS LIST OF NEXT ASS'Y)

(1) IN THIS CASE, TERMINAL 1 MUST BE UNGROUNDED

(2) TERMINAL 12 MUST BE UN-GROUNDED.

(A) (E) TERMINAL 13 MUST BE GROUNDED.

(1) THIS SWITCH TO BE PROVIDED BY CUSTOMER OR BY 3-BIN SORT

NOTES:

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	ADDED NOTES 1 THRU 4, ADD E2630684 ADDED GROUND TO ENCLOSURE	4-1569	

QTY REQ'D	NOMENCLATURE OR DESCRIPTION	CODE IDENT	IDENTIFYING NUMBER	SPECIFICATION	MATERIAL OR NOTE	ITEM NO

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± 1/64, DECIMALS .XX ± .010 .XXX ± .005, ANGLES ± 1/2°

	BY	DATE
DESIGN		
DRAFTED	RM	4-1-69
CHECKED	RMR	4-1-69
APPROV		
CHECKED	RMR	4-8-69

MATERIAL:

FINISH:

MODEL NO.

PART NO. 1605654

DELTA DESIGN INC
8000 FLETCHER PKWY
LA MESA, CALIF. 92041
TEL A/C (714) 465 6141

TITLE: DIAGRAM, CONNECTION MINI-LOOP AMBIENT HANDLER

SIZE	CODE IDENT. NO	DRAWING NO.	REV LTR
D		D1605654	A

SCALE 1:1 SHEET ___ OF ___

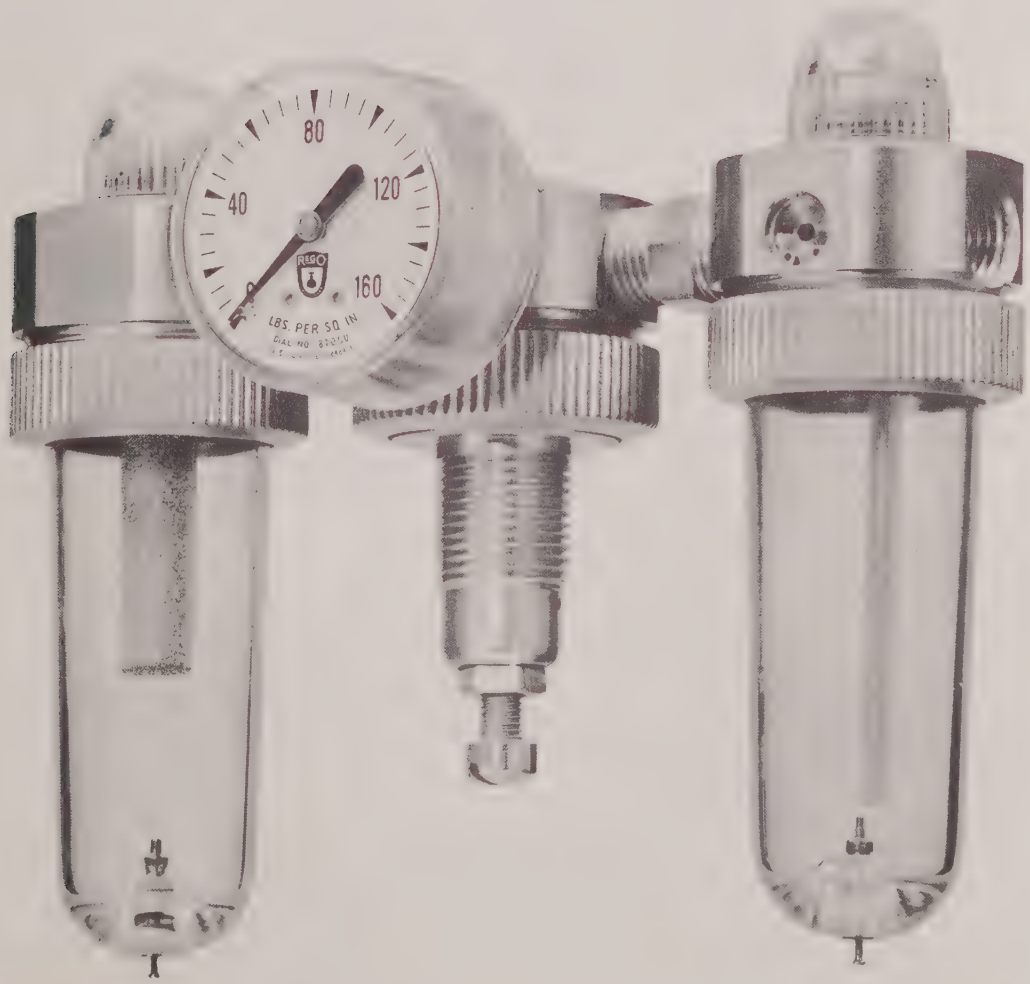
NEXT ASSY	USED ON	SERIAL NOS.	DATE EFF	DWG REV LTR
02605653 WITHOUT REPROBE	E2630684 (A)			
02605691 WITH REPROBE				

APPLICATION EFFECTIVITY

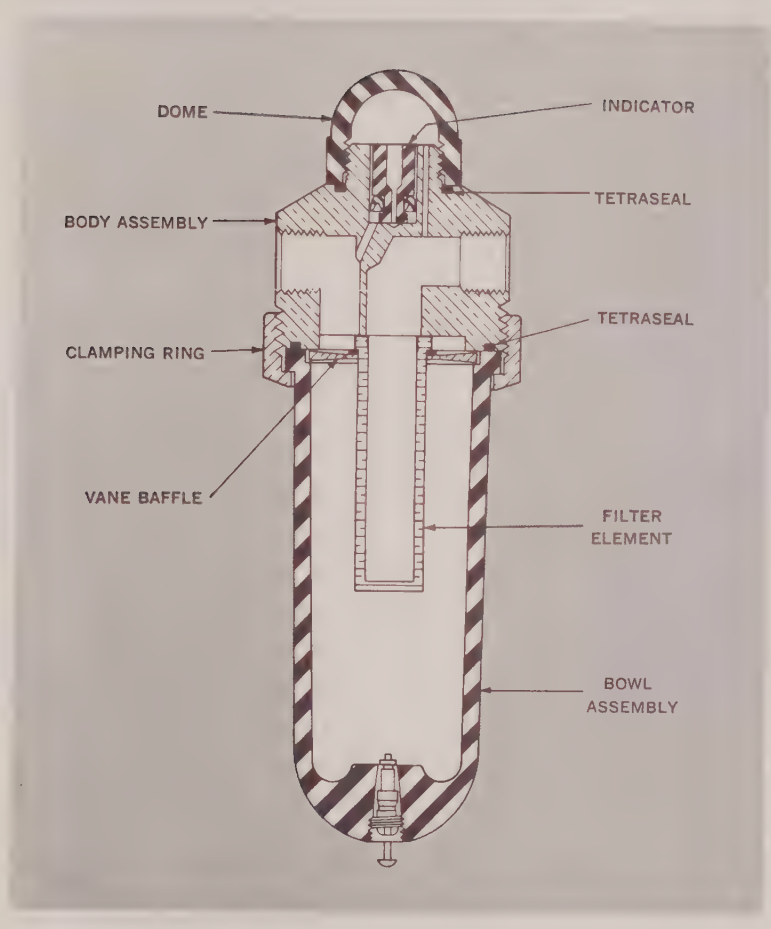
INSTALLATION AND SERVICE INSTRUCTIONS

MINI-LINE

FILTERS · REGULATORS · LUBRICATORS



MINI AIR LINE FILTERS



OPERATION

1. Solids and free moisture are automatically removed by the Mini-Filter.
2. Accumulated moisture must be drained whenever it fills the reservoir bowl to the level of the filter element. To drain the bowl, push up on the petcock stem.
3. When the filter element requires cleaning, the visual filtergard indicator will look "yellow." Once the indicator has popped up, it will remain up regardless of air flow or pressure change.

OPERATING RANGES

WORKING PRESSURE.....150 psi maximum
TEMPERATURE RANGE.....+10°F. to +125°F.

INSTALLATION

Filters must be installed with air flow in the direction indicated on the body. When used with a regulator and/or lubricator, the filter should be installed upstream from these units. Filters should always be installed as far as possible downstream towards the point of air use. Mini-Filters must be installed with the transparent bowl hanging down so that trapped moisture will collect in the bottom of the bowl.

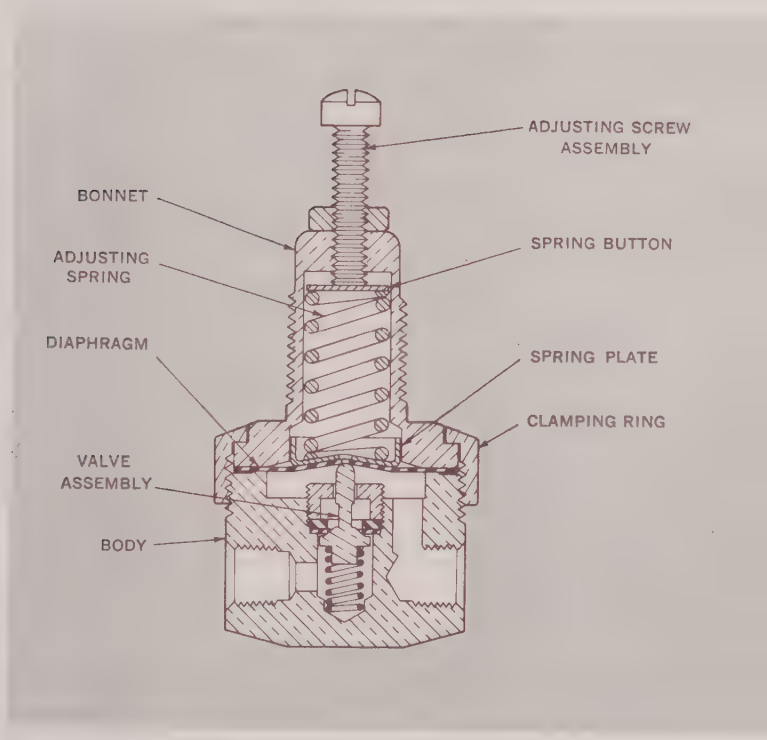
NOTE: Due to rough handling in transit, the visual filtergard indicator may look "yellow" when the filter is received. It **must** be reset before the filter can be placed in service. Unscrew the dome, reset the indicator, and replace the dome.

CLEANING

CAUTION: Do not attempt to remove bowl under pressure.

1. Shut off the air supply and depress the petcock stem to bleed down residual pressure.
2. Unscrew and remove the clamping ring.
3. Remove and invert the bowl assembly. The filter element will drop out of the bowl assembly.
4. Wash the filter element and bowl in kerosene, white gasoline, or soap water. **Gasoline with additives, or any fluid or solvent containing acetone, ethylacetate, ethylene dichloride, toluene, etc., must not be used or bowl will be damaged.**
5. Dry the filter element by blowing compressed air from the inside outward after washing.
6. Unscrew the dome and manually reset the yellow indicator.
7. Reassemble the unit.

MINI AIR LINE REGULATORS



OPERATING RANGES

PRIMARY PRESSURE.....250 psi maximum
DELIVERY PRESSURE.....5-125 psi
TEMPERATURE RANGE.....+10°F. to +165°F.

INSTALLATION

1. To assure dependable operation, a Mini-Filter should be used with the regulator to guard against contamination from foreign matter.
2. Regulators must be installed with air flow in the direction indicated on the body. When used with a filter and/or lubricator, the regulator should be installed between these units with the filter on the upstream side and the lubricator on the downstream side. Regulators should always be installed as far as possible downstream towards the point of air use.
   Mini-Regulators may be installed in any position for convenient adjusting screw operation with no loss in operating characteristics.

SERVICING

CAUTION: Do not attempt to disassemble regulator while line is under pressure.

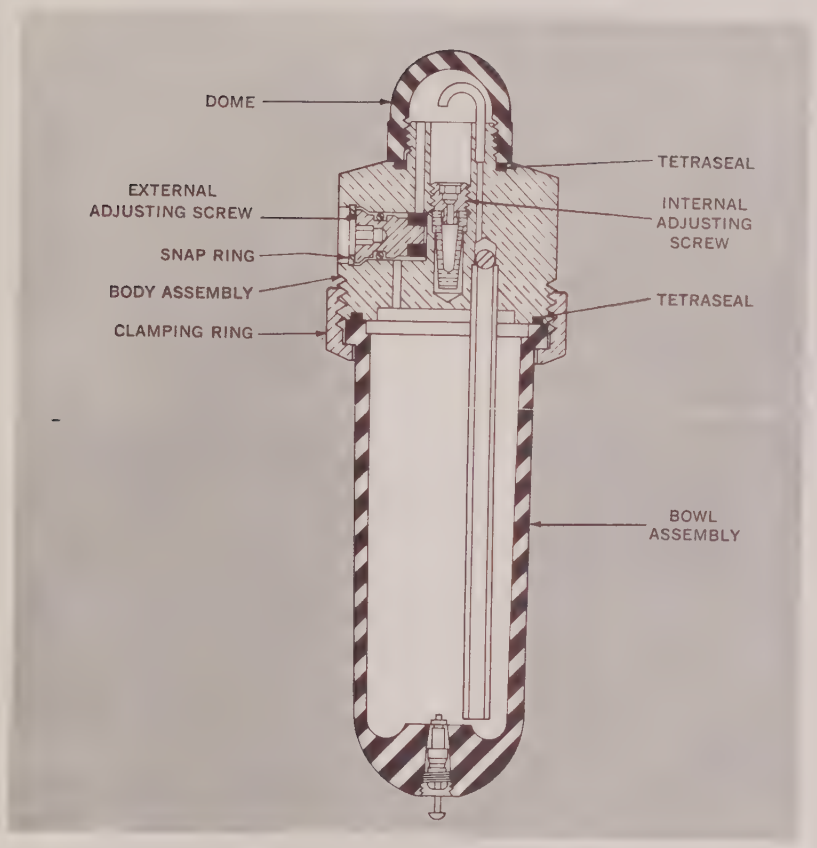
If regulator requires servicing, it can be completely disassembled while still installed in the air line.

PRESSURE ADJUSTMENT

Regulator adjustment must be made with the line pressure valve open. Carefully follow these steps:

1. Turn the regulator adjusting screw counter clockwise to release compression from the adjusting spring.
2. Open the line pressure valve.
3. Adjust the operating pressure by turning the adjusting screw clockwise until the gauge indicates the desired pressure.
4. To lower the pressure setting, turn the adjusting screw counter clockwise until the gauge reading is approximately 5 psi lower than the desired delivery pressure. Then, slowly turn the adjusting screw clockwise until the desired pressure is obtained.
5. When the required pressure has been determined under normal operating conditions, the adjusting screw lock nut should be tightened to prevent tampering.

MINI AIR LINE LUBRICATORS



OPERATING RANGES

WORKING PRESSURE.....150 psi maximum
TEMPERATURE RANGE.....+10°F. to +125°F.

INSTALLATION

1. To assure dependable lubrication, a Mini-Filter should be installed upstream from the lubricator.
2. Lubricators must be installed with air flow in the direction indicated on the body. When used with a filter and/or regulator, the lubricator should be installed downstream from these units. Lubricators should be installed as close as possible to the device to be lubricated. Avoid installations that require the air-oil mixture to move upward from the lubricator to the device to be lubricated.
3. To assure proper lubrication, install a separate lubricator for each air operated device.
4. Mini-Lubricators are designed for operation under the air flow rate normal for the port size of each unit. Subnormal air flows may result from use of speed control valves, in which case the lubricator size should be selected according to **anticipated air flow rates** rather than the port size of the devices to be served.

OPERATION

1. **IMPORTANT: Use only those oils recommended by the supplier as suitable for pneumatic-hydraulic service. Oils with adhesive-type additives should not be used.** Use oil with a viscosity of 80 to 150 SSU at 100°F. Compounded oils, including automotive oils, containing detergents or other additives such as solvents, soaps or graphite are not recommended.
2. To fill the oil reservoir bowl:
   a) Shut off the air supply and bleed down line pressure.
   b) Unscrew and remove the clamping ring.
   c) Remove the bowl and fill with oil (See #1, above).
   d) Replace the bowl and clamping ring and turn on air supply.
3. Operate the air equipment to be lubricated and observe the oil delivery rate in the oil feed indicator dome. The rate of oil feed shown in the dome is 100% of the oil that is being injected into the air stream in mist form.
4. The oil delivery rate has been factory pre-set to provide proper lubrication for most operating conditions. It may be adjusted within normal operating ranges by turning the external adjustment. For extreme air flow rates (less than .5 CFM or extremely high flow) it is necessary to adjust the oil delivery rate internally. To do this:
   a) Shut off the air supply and bleed down line pressure.
   b) Unscrew and remove the dome.
   c) Using a 3/32" allen wrench, turn the internal adjusting screw clockwise to increase the delivery rate or counter clockwise to decrease the rate.
   d) Replace the dome and turn on line pressure.

CLEANING

CAUTION: Do not attempt to disassemble unit while line is under pressure.

1. Shut off the air supply and bleed down line pressure.
2. Unscrew and remove the clamping ring.
3. Remove and wash the bowl in kerosene, white gasoline or soap water. **Gasoline with additives or any fluid or solvent containing acetone, ethyl acetate, ethylene dichloride, toluene, etc., must not be used or bowl will be damaged.**
4. Unscrew and remove the dome; unscrew and remove the internal oil adjusting screw.
5. Wash the screw assembly and blow off the sintered element with compressed air.
6. Wash the body assembly, and blow out the air and oil passages with compressed air.
7. Replace the internal adjusting screw and replace the dome.
8. Fill the bowl with oil as described under step #2 of OPERATION instructions.

⚠1 SELECT REED RELAY FOR BUFFERED INPUT (IF USED), ACCORDING TO CUSTOMERS INPUT VOLTAGE:

VOLTAGE	RELAY
5-12 VDC	OF-1A-6
12-24 VDC	OF-1A-12
24-48 VDC	OF-1A-24

PLUG INTO PROPER SOCKETS TO OBTAIN CONTACT OPENING UPON END OF TEST

REED RELAY IS NOT NEEDED IF CUSTOMER DOES NOT REQUIRE BUFFERED INPUT, OR IF THE CONTACT CLOSURE FROM A 3-BIN SORT IS USED.

⚠2 R4 MOUNTS ON TURRET TERMINALS, CONTROLS PARTS DROP-PICK UP DELAY.

R4, OHMS	DELAY, MILLISECONDS
47K	33
10K	70
22K	154
47K	329

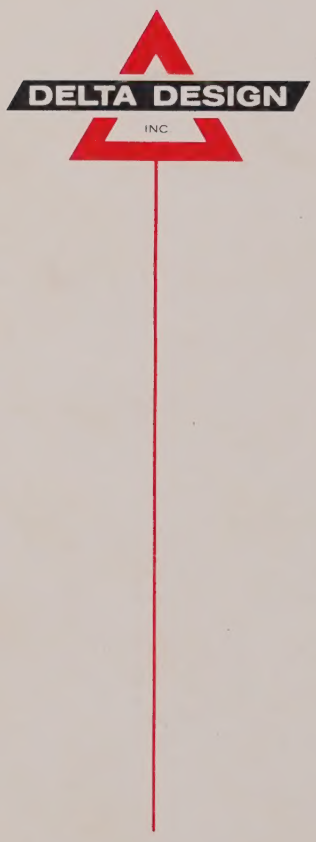
NOTES:

DELTA DESIGN INC.
8000 FLETCHER PKWY
LA MESA, CALIF. 92041
TEL. A/C (714) 465-8181

TITLE: P.C. BOARD ASSY, MINI-LOOP ELECTRONICS WITH RE-PROBE

DRAWN: L.m / 5/2/69
CHECKED: MHR 3-31-69

SIZE: D
DRAWING NO.: D2604849
PART NO.: 2604849



LA MESA, CALIFORNIA

MP MASTER
MA32439